

REMARKS

Reconsideration of the application in light of the amendments and following remarks is respectfully requested.

Status of the Claims

Claims 1 - 7 and 9 are presently pending, with claim 8 having previously been canceled.

Claims 1, 7 and 9 have been amended, and claims 10 and 11 are newly added. No new matter is introduced. Support for the amendments may be found, for example, with reference to Applicants' specification at page 8, lines 10 through 16; page 10, line 11 through page 11, line 24; and page 12, line 23 through page 15, line 13; and with reference to Applicants' FIGs. 1, 2, 4, 5, 7 and 8.

Objections to the Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. Specifically, the Examiner finds that the limitations associated with “the flexible member” as recited in claims 1, 7 and 9 lack proper antecedent basis in the specification. Applicants amend claims 1, 7 and 9 to further clarify the features of the flexible member. With reference to FIG. 1, which depicts one example of a coupling structure that is consistent with the principles of the present invention, a flexible member 57 projects in a depth dimension of the engagement groove 21 and extends externally from the engagement groove 21 along a longitudinal direction of the groove (see, e.g., FIG. 2) to engage positioning recess 12 in a manner that regulates movement in the longitudinal direction. A slip-off preventing groove (semi-circular groove) 11c of the shaft body 1 receives a coupling shaft 6 which is inserted through bores 22, 23 (see, e.g., FIG. 3 and through the slip-off preventing groove 11c. Applicants submit that each of these features as claimed in amended independent claims 1, 7 and 9 has sufficient antecedent basis in view of the specification and drawings, and respectfully request that the objections to claims 1, 7 and 9 be withdrawn.

Objections to the Claims

Claim 9 is are objected to for informalities. Specifically, the Examiner the Examiner finds that the term "it" as used at line 11 of claim 9 should be further defined. Applicants amend claim 9 to make clear that the "it" is the flexible member that engages the positioning recess to regulate movement of the shaft body in a longitudinal direction. On this basis, Applicants respectfully request that the objection to claim 9 be withdrawn.

Rejections Under 35 U.S.C. § 102

Claims 1-6 and 9 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,358,350 to Oertle. Applicants amend claims 1 and 9 to further define the nature of their invention, and respectfully traverse the rejections under 35 U.S.C. § 102(b).

In amended independent claim 1, Applicants claim:

1. A coupling structure, comprising:

a shaft body having a slip-off preventing groove and a positioning recess close to an end portion thereof;

a shaft joint having an engagement groove with which the shaft body is engaged, bores facing the engagement groove, and

a flexible member which projects in the depth direction of the engagement groove, extends externally from the engagement groove along a longitudinal direction of the shaft joint, and engages the positioning recess such that the flexible member regulates movement of the shaft body in a longitudinal direction, an engagement direction of the flexible member with the positioning recess being perpendicular to the longitudinal direction; and

a coupling shaft, which is inserted into the bores and the slip-off preventing groove, for coupling the shaft body and the shaft joint.

(Emphasis added).

Oertle discloses a coupling member for a steering column of a motor vehicle (see, e.g., abstract of Oertle) In the coupling member 1, resilient tongues 24 are brought to rest on an indentation 10 in a surface of a shaft journal 12 The tongues 24 prevent the shaft journal 12 from being withdrawn in either of a vertical direction or a longitudinal direction from the coupling member 1 (see, e.g., FIGs. 1, 5 and 15 of Oertle).

However, in sharp contrast to the coupling structure claimed by Applicants in amended independent claim 1, Oertle fails to disclose or suggest that the tongues 24 extend externally from an engagement groove of the coupling member 1 along a longitudinal direction of the shaft journal 12 and engage a positioning recess along a line of contact that is perpendicular to the longitudinal direction (emphasis added) Rather, the tongues 24 of Oertle are contained entirely within the longitudinal extent to coupling member 1, and contact the indentation 10 along a line of contact that is arguable parallel to the longitudinal direction of the shaft journal 12(see, e.g., FIG. 5 of Oertle).

As Oertle therefore does not disclose each and every feature of amended independent claim 1, Applicants respectfully submit that amended claim 1 is allowable. Because amended independent claim 9 essentially includes the same features above-argued with regard to amended independent claim 1 as patentably distinguishing amended independent claim 1 over Oertle, Applicants submit that amended independent claim 9 is also allowable for at least the same reasons as amended independent claim 1. As claims 2-6 depend from allowable independent claim 1, Applicants further submit that claims 2 - 6 are also allowable for at least this reason.

Therefore, Applicants respectfully request that the rejection of claims 1-6 and 9 under 35 U.S.C. § 102(b) be withdrawn.

Rejections Under 35 U.S.C. § 103

Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,474,898 to Aota et al. ("Aota"), in view of Japanese patent JP8-338440 ("JP '440"). Applicants amend claim 7 to further define the nature of their invention, and respectfully traverse the rejection under 35 U.S.C. § 103(a).

In amended independent claim 7, Applicants claim:

7. A coupling structure, comprising:

a shaft body having a positioning recess close to an end portion thereof;

a shaft joint having an engagement groove engaging the shaft body;

bores facing the engagement groove; and

a flexible member projecting ins a depth direction of the engagement groove, extending externally from the engagement groove along a longitudinal direction of the engagement groove, and engaging with the positioning recess in a direction perpendicular to a longitudinal direction of the shaft body;

a coupling shaft inserted into the bores and coupling the shaft body and the shaft joint; and

a semi-circular groove near an end portion of the shaft body containing the coupling shaft.

(Emphasis added).

The Examiner states that Aota discloses most of the features of the claimed invention, but admits that Aota does not disclose a flexible member with the features recited in claim 7. However, the Examiner suggests that JP '440 discloses a flexible member having the features claimed by claim 7. Applicants respectfully disagree.

JP '440 discloses a connection for an adjustable joint for joining a shaft to a yoke. A flexible member ("keep plate piece 37") has arms 39 which are inserted through holes 36 in yoke 3 to engage shaft surface 47 of the shaft 7, thereby preventing movement of the shaft 7 in the depth direction of the yoke 3 (see, e.g., FIGs. 2 and 10 of JP '440).

In sharp contrast to the flexible member claimed by Applicants in amended independent claim 7, the keep plate piece 37 of JP '440 does not extend externally from the engagement groove along a longitudinal direction of the engagement groove. Rather, keep plate piece 37 is positioned within the extent of yoke 3 in the longitudinal direction, and extends beyond the yoke 3 only in a lateral direction of the yoke 3. Moreover, keep plate piece 37 cannot be said to engage shaft surface 47 in a direction that is perpendicular to a longitudinal direction of the shaft 7. Each of the arms 39

of keep plate piece 37 makes a point contact with the surface 47. Arguably, the point contacts between the arms 39 and the shaft surface 47 together define a direction of contact that is parallel to the longitudinal direction of the shaft 7.

These claimed elements of Applicants' flexible members, which are not disclosed or suggested by either of Aota and JP '440, serve to enable the claimed coupling structure to perform an important function not taught or suggested by either of these references. As described for example with reference to FIG. 8, by providing a flexible member that extends externally from the engagement groove along a longitudinal direction of the engagement groove, a finger portion of the flexible member is made available which may be displaced to cancel the engagement of the flexible member with the positioning recess so that the shaft body may be withdrawn from the shaft joint (see, e.g., page 14, line 15 through page 15, line 6 of Applicants' specification).

Accordingly, Applicants submit that, for at least the above-argued reasons, claim 7 is not obvious in view of Aota and JP '440, and stands in condition for allowance. Therefore, Applicants respectfully request that the rejection of claim 7 under 35 U.S.C. § 103(a) be withdrawn.

New Claims

Applicants introduce new claims 10 and 11, which depend from allowable claim 1. Applicants respectfully submit that new claims 10 and 11 are also allowable for at least this reason.

CONCLUSION

Each and every point raised in the Office Action, dated May 9, 2007 has been addressed on the basis of the above amendments and remarks. In view of the foregoing it is believed that pending claims 1-7 and 9- 11 are in condition for allowance and it is respectfully requested that the pending claims be allowed and the case passed to issue.

If there are any other issues remaining which the Examiner believes could be resolved through a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

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Respectfully submitted,

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